

REMARKS

The present application included claims 1-7, 13, 21, 28-38 and 42. By this Response, claims 1, 6, 13, 21, 28, 34-36 and 42 have been amended; while claims 7-12, 14-20, 22-27 and 38-41 have been canceled without prejudice or disclaimer. The Applicant respectfully requests reconsideration of the claim rejections for at least the reasons previously discussed during prosecution and the following:

Drawings

The drawings were objected to under 37 CFR 1.83(a) on the grounds that the drawings must show every feature of the invention specified in the claims. In order to expedite prosecution towards allowance, the Applicants have amended the claims to suit the Examiner's preferences. The Applicants are not, however, conceding the propriety of the drawing objections (or claim rejections based on 35 U.S.C. 112). The Applicant maintains that the claims and drawings were acceptable as previously pending, and reserves the right to pursue the claims as previously pending in a continuation application.

Nevertheless, in response to the drawing objections, the Applicant has amended the claims to clarify that the claimed subject matter focuses on a transponder *for use* in a tracking system. The tracking system itself is not claimed in claims 1, 13, and 28.

With respect to the method of claim 21, Figures 1-6 and the associated description show and describe the signal transmission recited in the claim. As such, the Applicant is not **required** to submit a flow chart that reiterates the description within the specification.

Claims 6 and 34 have been amended to further refine the switch and its operation, rather than claiming the controller itself. Therefore, the Applicant submits that the drawings should be acceptable as filed, and the objection should be withdrawn.

35 USC 112

Claims 1-7, 13, 21, 28-38 and 42 stand rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement. Again, In order to expedite prosecution towards allowance, the Applicants have amended the claims to suit the Examiner's preferences. The Applicants are not, however, conceding the propriety of this rejection. The Applicant maintains that the claims were acceptable as previously pending, and reserves the right to pursue the claims as previously pending in a continuation application.

The claims are directed to a novel and non-obvious transponder configuration and signal generation to be used by tracking electronics to determine position and orientation according to known techniques. Therefore, the Applicant respectfully requests reconsideration of this rejection.

Claims 1-7, 13, 28-38 and 42 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention. The Applicant has amended the claims to clarify that the claims are directed to a transponder (and method of use) **for use** in an electromagnetic tracking system, rather than claiming an electromagnetic tracking system. Thus, the Applicant respectfully requests that the Examiner's rejection be withdrawn.

Claim 42 has been amended to recite that it depends from claim 21, not claim 22. Thus, the Applicant respectfully requests reconsideration of this claim rejection.

Claim Rejections – 35 USC 103

Claim 21, 28-29, 32-34 and 42 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 5,443,066 ("Dumoulin") in view of U.S. 4,160,971 ("Jones") or U.S. 6,097,189 ("Arndt") and U.S. 4,196,418 ("Kip"). Claims 30 and 31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dumoulin in view of Jones or Arndt and Kip and U.S. 5,153,583 ("Murdoch"). Claims 1-7, 13 and 35-38 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dumoulin in view of Jones or Arndt and Kip and U.S. 5,241,923 ("Janning"). The Applicant respectfully traverses these rejections for at least the reasons previously set forth during prosecution and the following:

The Applicant first turns to the rejection of claims 21, 28-29, 32-34 and 42 as being unpatentable over Dumoulin in view of Jones (or Arndt) and Kip. Claim 21 has been amended to recite the following:

A method for transmitting data in a wireless
electromagnetic tracking system comprising:

transmitting a signal from a transponder using a rectifying device and a capacitor connected in parallel with a coil, wherein said signal contains at least a first frequency and a second frequency, wherein a position and orientation of said transponder are determined based at least in part on said signal;
varying at least said second frequency using said rectifying device to produce a variation in at least said second frequency;

varying a waveform characteristic of at least said second frequency using said capacitor to produce a variation in at least said second frequency; and

encoding data in said signal based upon said variation in at least said second frequency.

The Applicant respectfully submits that the Office Action has not shown or explained where the cited references describe, teach or suggest at least “varying a **waveform characteristic** of at least said second frequency **using said capacitor** to produce a variation in at least said second frequency,” as recited in claim 21. The Office Action does not specifically mention this limitation in the rejection. Thus, for at least this reason, the Applicant respectfully requests reconsideration of this claim rejection.

Claim 28 has been amended to recite the following:

A transponder for use in a wireless electromagnetic tracking system for providing location information for an object in a medical environment, said transponder including:

a coil for transmitting a response signal in response to an excitation signal, wherein a position and orientation of said transponder are determined based at least in part on said response signal; and

a switching device connected in parallel with said coil to alter non-linear and waveform characteristics of said response signal to distinguish said response signal from said excitation signal and used to distinguish said transponder from other transponders and to determine said position and orientation of said transponder based at least in part on said response signal, wherein said response signal transmits data based on said non-linear and waveform characteristics altered in said response signal.

The Applicant respectfully submits that the Office Action has not shown or explained where the cited references describe, teach or suggest at least “a switching device connected in parallel with said coil to alter **non-linear and waveform characteristics of said response signal to distinguish said response signal from said excitation signal...** wherein said response signal transmits data based on said **non-linear and waveform characteristics** altered in said response signal,” as recited in claim 28. The Office Action does not specifically mention these limitations in the rejection. Thus, for at least this reason, the Applicant respectfully requests reconsideration of the claim rejections.

The Applicant next turns to the rejection of claim 30-31 as being unpatentable over Dumoulin in view of Jones (or Arndt), Kip and Murdoch. The Applicant respectfully requests reconsideration of these claim rejections for at least the reasons set forth above.

The Applicant next turns to the rejection of claims 1-6, 13 and 35-38 as being unpatentable over Dumoulin in view of Jones (or Arndt), Kip and Janning. Claim 1 recites, in part, “wherein said **non-linear characteristics** introduce **at least one additional frequency in said response signal that is not found in said excitation signal**, and wherein said response signal **transmits data based on fluctuations** in said response signal.” The Office Action is not clear as to where at least these limitations are found in the cited references. The Office Action does not specifically mention these limitations. Thus, for at least these reasons, the Applicant respectfully requests reconsideration of the rejection of claims 1-6 and 35-38.

Claim 13 recites, in part, the following:

a capacitor connected in parallel across the two terminals to said coil, said **capacitor varying voltage and current values in said response signal based on variations in the capacitance of said capacitor**,

wherein said **non-linear characteristics** introduce **at least one additional frequency in said response signal that is not found in said excitation signal** and said **capacitance introduces waveform characteristics** allowing said transponder to be distinguished from other transponders, and wherein said response signal **transmits data based on fluctuations in said response signal**.

The Applicant respectfully notes that the Office Action is not clear as to where these limitations are found in the cited references. The Office Action does not specifically mention these limitations. Thus, for at least these reasons, the Applicant respectfully requests reconsideration of the rejection of claim 13.

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In general, the Office Action makes various statements regarding the pending claims and the cited references that are now moot in light of the above. Thus, the Applicant will not address such statements at the present time. However, the Applicant expressly reserves the right to challenge such statements in the future should the need arise (e.g., if such statement should become relevant by appearing in a rejection of any current or future claim).

The Applicant respectfully requests reconsideration of the claim rejections for at least the reasons discussed above. If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited to contact the undersigned attorney.

The Commissioner is authorized to charge any necessary fees, or credit any overpayment the Deposit Account of GTC, Account No. 07-0845.

Respectfully submitted,

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MCANDREWS, HELD & MALLOY, LTD.
500 West Madison Street, 34th Floor
Chicago, Illinois 60661
Telephone: (312) 775-8000
Facsimile: (312) 775-8100

/Joseph M. Butscher/
Joseph M. Butscher
Registration No. 48,326
Attorney for Applicants